IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

LAINE et al		Atty. Ref.:	**30-543**
Serial No.	**09/787,629**	Group:	**1731**
Filed:	**March 21, 2001**	Examiner:	**Alvo**

For: **METHOD AND APPARATUS FOR THE THICKENING OF FIBER SUSPENSIONS**

* * * * * * * * * * *

December 16, 2003

Honorable Commissioner of Patents
and Trademarks
Washington, DC 20231

APPLICANT'S APPEAL BRIEF

Sir:

Applicant hereby appeals the Examiner's "final" rejection of claims 20 and 22-28[1] in the Official Action dated May 19, 2003. As will become evident from the following discussion, the Examiner's art-based rejections are in error and, as such, reversal of the same is solicited.

I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the subject application, Andritz Oy (formerly Andritz-Ahlstrohm Oy).

[1] The appealed claims are set forth in the Appendix hereto.

II. RELATED APPEALS AND INTERFERENCES

The appellant and the undersigned are not aware of any related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

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Claims 20 and 22-28 are pending in the subject application. Each pending claim has been rejected in the "final" Official Action dated May 19, 2003.

IV. STATUS OF AMENDMENTS

No amendments after the "final" Official Action dated may 19, 2003 have been filed.[2]

V. SUMMARY OF INVENTION

The invention at issue is directed toward apparatus for treating pulp, and especially for the thickening of pulp. The apparatus is especially well suited for applications where liquid is to be removed from fiber suspensions with a relatively low energy consumption, such as pre-thickeners or the like used in connection with various known filters. However, the apparatus of the present invention may also be utilized as the actual filter, by means of which thickened pulp consistencies of up to 15% may be achieved. (Page 1, lines 3-11.)

The structures of the apparatus as claimed function so that the pressure prevailing in the apparatus is sufficiently high enough to feed the pulp into the filter. Significantly, the apparatus includes, between the inlet conduit and the fiber suspension discharge conduit, a filter surface having a substantially round cross section, and a cleaning member positioned inside the filter surface. The cleaning member has a

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rotating shaft, and at least one screw thread fixed to the rotating shaft for keeping the filter surface clean. The fiber suspension and filtrate discharge conduits for the thickened pulp and the filtrate, respectively, are provided with valves for controlling the operation of the apparatus. According to the present invention, therefore, these valves are controlled in response to input power to the shaft, on the basis of an impulse from a previous process stage or a pressure difference prevailing over the filter surface. As such, fresh pulp is delivered onto the whole length of the filter surface due to being constantly wiped by the screw thread. (Page 6, line 19 through page 7, line 22, Figure 2 and the description thereof on page 8, line 20 through page 10, line 12.)

VI. ISSUE

The following issue is presented for purpose of this appeal:

> "Has the Examiner erroneously applied the proper statutory standards when rejecting claims 20 and 22-28 under 35 USC §103(a) as allegedly unpatentable over Laakso in view of Reinhall '444, with or without Gervasi?

VII. GROUPING OF CLAIMS

Claims 20 and 22-28 may be considered to be grouped as standing or falling together for purpose of this appeal.

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The Examiner has applied an erroneous standard of review in rejecting claims 20 and 22-28 under 35 USC § 103(a) over Laakso in view of Reinhall '444, with or without Gervasi.

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Applicant notes that Laakso discloses a system to presteam and deaerate chips. The deaeration means comprises a horizontally extending vessel 12, having a horizontal axis, and a rotatable screw extending along the axis. Steamed chips entrained in liquid are fed into the horizontal vessel at one end thereof, and deaerated chips are removed from the vessel at the other end thereof. Liquid circulation loops are provided at both the inlet to, and the outlet from, the horizontal vessel. At a central portion of the vessel, deaerated liquid is continuously circulated into contact with material passing in the vessel. Screens which are parallel to the axis of the vessel are part of the system for providing for the flow of deaerated liquid. A closed recirculatory loop of such liquid is provided, and a liquid and air separator is provided in that loop to effect deaeration of the liquid flowing therein.

Significantly, Laakso does not disclose or suggest at all a thickener apparatus for pulp. In the Laakso system, the chips are deaerated while being conveyed, and mechanically agitated, by the screw 69. This function is accomplished hydraulically, utilizing the header 76, and bottom and top screens 77, 78. The screens 77 and 78 are parallel to the axis 68. Preferably each of the screens 77, 78 is arcuate and covers approximately one-quarter the circumference of the path of chips flowing generally horizontally through the vessel 12. The consistency does not change when the material flows in vessel 12 because there is a closed loop (80, 81, 82, 79) of a deaerated liquid. The deaerated liquid is introduced by conduit 79 into the bottom of the header 76,

passes upwardly through the screens 77, 78 generally transverse to the axis 68, and passes out the top of the vessel 12 under the influence of pump 80. The liquid passing through the chips removes air from the chips and replaces it with liquid. The heated, deaerated chips are discharged from the vessel 12 through chute 73 in the low pressure loop of the high-pressure feeder 14, and are transferred under the influence of the high pressure pump 85 to the top of the digester.

Significantly, therefore, in the Laakso apparatus, filtrate is ***not*** removed from the chips. Thus, Laakso does not suggest or disclose in any way an apparatus even arguably functionally similar to the present invention whereby filtrate is removed from pulp so that the pulp will be thickened.

From the discussion above, therefore, it is clear that Laakso does ***not*** teach an apparatus for treating pulp, but instead teaches an apparatus for treating wood chips. Such a distinction is technically significant. As is well known, after debarking, logs are reduced to chips suitable for the subsequent pulping process, in which pulp is produced. The "ideal" chip size is usually considered to be about 20 mm long in the grain direction, and about 4 mm thick.

In continuous cooking, the chips are preheated in a steaming vessel before entering the digester to remove air and noncondensibles. The pulp is produced in the digester, when chips and cooking liquor are cooked at a high temperature. Following completion of the cook, hot spent liquor is extracted from the pulp. The pulp is washed and screened before bleaching, if any.[3]

Laakso's apparatus is used ***prior to*** cooking, when a raw material for cooking (i.e., chips) are treated. In fact, the Examiner will note that in Fig. 4 (col. 6, line 22-20) it is described how the chips are discharged from the Laakso apparatus to the top of a digester. In direct contrast, the present invention relates to an apparatus for treating

[3] Such well known technical aspects were also described in the extract from "Pulp and Paper Manufacture", Vol. 5 Alkaline Pulping, which accompanied the Applicant's Response dated August 14, 2003, and which the Examiner has refused to consider. Notwithstanding such non-consideration, it is

pulp produced in cooking. Preferably, the apparatus of the present invention is used in screening of pulp.

The Examiner asserts that:

> "Laakso as Applicant removes excess liquid from the pulp with pumps (80) and (67)".

However, the pump 80 of Laakso is part of a closed recirculatory loop in which liquid is removed from the vessel, but the liquid is returned to the vessel 12 (through line 79 after deaeration in a conventional separator (81). The chute 58, pump 67, drainer 63 and inlet 60 provide a recirculatory loop for providing liquid for entraining chips (col. 4, line 64-66). In the chute 58, the chips are entrained in liquid which is supplied through the inlet 60. A liquid level is established by throttling the discharge line from the drainer 63 through pump 64. The chute 73 for discharging the chips from the vessel 12 comprises part of the circulatory loop of the high-pressure feeder 14. The chute 73 is filled with liquid all the times, and the entire column of liquid from the liquid level provides a hydraulic head sufficient to overpressure the transfer device 14 (col. 5, line 9-15). Therefore, Laakso does ***not*** dewater the chips at all.

In the Laakso apparatus, the chips are conveyed and mechanically agitated by means of the screw 69. The chips are collected on the internal wall of the screen only to some extent, because there is ***no pressure difference over the screen surface***. Laakso does not teach that there would be any material collecting on the screen surface which should be removed. Instead, it is merely enough for the chips entrained in liquid are mixed which also improves deaeration.

Combining the applied Reinhall '444 reference with Laakso is entirely inappropriate under the proper standards for reviewing patentability under 35 USC §103(a).

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believed that the Examiner and this Board must take official notice of the conventionality of the general post-cooking pulp processing as described therein.

In this regard, applicant notes that Reinhall '444 discloses a dewatering apparatus for fiber pulp. The dewatering apparatus of Reinhall is in the form of a relatively long vertical container 14 provided with inlet and outlet means for the suspension and a stirrer driven by an electric motor. Separate sets of perforations 24 are provided in the wall of the container, each set of perforations communicating with a compartment 64 located externally of the container for drainage of water pressed out of the fiber pulp suspension in the container. The compartments communicate through separate one-way valves 68 with a common discharge conduit provided with a control valve 32. The pressure in the compartments is regulated but maintained lower than in the container to control drainage of water pressed out of the fiber pulp suspensions through the perforations. The suspension is preferably introduced under superatmospheric pressure into the container such as by means of a pump. The pulp is fed to the dewatering apparatus by means of pump 48 through a conduit 50 and valve 52. The pulp feed is controlled by pump 48. The dewatered pulp passes from the outlet of the dewatering apparatus into the inlet of a grinding machine by means of a screw conveyor 54.

The Reinhall '444 apparatus thus has a valve in the pulp feeding line and several valves (68, 32) in the filtrate discharge line. The filtrate valve 32 is used to control the filtrate flow. Significantly, ***there is no valve in the pulp discharge***, but instead the pulp discharge opens out ***directly*** to screw conveyer 54.

The Examiner asserts that Reinhall '444 teaches that the pulp material and filtrate exiting the vessel can be controlled by valves 50 and 34. Applicant respectfully cannot locate any valves having such reference numbers in the Reinhall document. Assuming the Examiner meant to refer to valves 60 and 32, applicant notes that valve 60 is in the outlet line of the grinding machine and it is in no way a control valve by means of which the operation of the dewatering apparatus can be controlled.

The Examiner argues that the applicant's invention is unpatentable because it would have been obvious that the material into and out of the dewatering vessel of Laakso could have been controlled using valves taught by Reinhall '444. As it is

already stated, the Laakso apparatus cannot in any way be considered a dewatering apparatus, but instead is a deaerator. Furthermore, the flows of the Laakso system are controlled by pumps – ***not*** valves. There is no need for any valves in Laakso system. In the applicants' opinion, it is not at all "obvious" to combine the teachings of Reinhall '444 with Laakso as the result would be a non-operable device. The deaerator of Laakso performs its task in the manner it is designed to operate, and new ways of using the valves cannot be incorporated in Laakso without defective results.[4]

Turning attention to the applied Gervasi reference, applicant notes that the filter of Gervasi operates in such a manner that liquid with turbid particles is fed from above into the filter, and the filter cake is allowed to form on the precoat layer of the filter surface. The worm rotates slowly in close proximity to the filter surface and scrapes off the filter cake from the precoat layer. The filtered material is collected in the conical bottom portion of the device wherefrom the filtered material is removed via gate valve and suction pump only when the conical part is filled with such material (column 4, lines 48 through 58).

In fact, it should be understood that the true operation of the filter discussed in Gervasi is such that in the beginning of the operation cycle the entire device is filled with the liquid to be cleared. The filtering proceeds in such a manner that clear liquid is filtered through the filter surface and the filter cake is scraped down into the bottom cone. In other words, the filter cake as heavier material displaces the liquid from the bottom cone and gradually fills the bottom while new liquid is introduced into the device. The operation is continued until the bottom cone is filled whereafter the operation is shut down and the cone emptied.

Again, there is clearly no suggestion or impetus provided to the ordinarily skilled person to combine Gervasi with Laakso, because the purpose of the respective apparatus is so vastly different – namely, one is a filter, while the other a deaerator. Hence, even if it

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[4] It is clearly improper (and hence evidence of *un*obviousness) to advance a combination of references where, like here, such a combination of references would destroy the structure of the reference for its intended purpose. *See, Ex party Thompson*, 184 USPQ 558 (Bd. of Appeals 1974), *Ex parte Hartmann*, 186, USPQ 366 (Bd. of Appeals 1974).

is assumed for the moment that Gervasi might somehow be combined with Laakso and Reinhall '444, the present invention would not result.

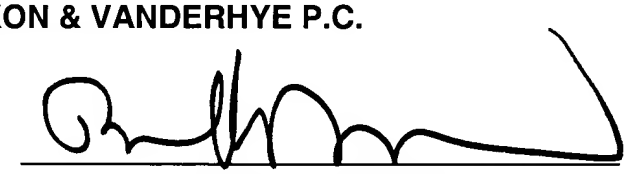
The combination of Laakso with Reinhall '444 and Gervasi is totally without merit and arbitrary, because they each relate to apparatus for treating respectively different materials and as such function entirely differently as compared to the apparatus as claimed herein. Therefore, in the context of a rejection advanced under 35 USC §103(a), there is clearly no suggestion or motivation provided to the ordinarily skilled person to combine the references in the manner the Examiner has done and thereby arrive at the present invention. Indeed, as noted above, even if combined, the present invention would not be the necessary result.

IX. CONCLUSION

The Examiner's art-based rejections of the claims pending herein are in error and must be reversed as being inapposite to the proper standards for reviewing patentability under 35 USC §103(a). Such a decision is therefore solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

Bryan H. Davidson
Reg. No. 30,251

BHD:lmy
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

APPENDIX

Claims on Appeal – USSN 09/787,629

20. An apparatus for treating pulp, which apparatus comprises:

an essentially elongated outer casing having first and second ends which are closed with first and second end plates, respectively;

an inlet conduit, P_{in}, at said first end of said outer casing for introducing a fiber suspension to be treated into the apparatus;

a fiber suspension discharge conduit, P_{out}, at said second end of said outer casing for discharging a thickened fiber suspension from the apparatus; and

a filtrate discharge conduit, F_{out}, provided in said outer casing for the filtrate; wherein

essentially at least between the inlet conduit and the fiber suspension discharge conduit the apparatus includes,

(i) a filter surface having a substantially round cross section, and

(ii) a cleaning member positioned inside said filter surface, said cleaning member comprising a rotating shaft, and at least one screw thread fixed to said rotating shaft for keeping the filter surface clean, and wherein

the fiber suspension and filtrate discharge conduits for the thickened pulp and the filtrate, respectively, are provided with valves for controlling the operation of the apparatus, and wherein

said valves are controlled in response to input power to the shaft, on the basis of an impulse from a previous process stage or a pressure difference prevailing over the filter surface.

22. An apparatus according to claim 20, wherein the screw thread is fixed on the shaft by means of tie rods which leave a free space between the shaft and the screw thread.

23. An apparatus according to claim 22, wherein a clearance between the screw thread and the filter surface is less than 5 mm.

24. An apparatus according to claim 23, wherein the clearance between the screw thread and the filter surface is less than 3 mm.

25. An apparatus according to claim 22, wherein the filter surface is provided with guides which prevent the fiber suspension from rotating inside the filter surface.

26. An apparatus according to claim 23, wherein the clearance between the screw thread and the filter surface is 0.2 – 2 mm.

27. An apparatus according to claim 25, wherein said guides include essentially axial grooves.

28. An apparatus according to claim 25, wherein said filter surface includes a screen.

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The Reinhall '444 apparatus thus has a valve in the pulp feeding line and several valves (68, 32) in the filtrate discharge line. The filtrate valve 32 is used to control the filtrate flow. Significantly, ***there is no valve in the pulp discharge***, but instead the pulp discharge opens out ***directly*** to screw conveyer 54.

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already stated, the Laakso apparatus cannot in any way be considered a dewatering apparatus, but instead is a deaerator. Furthermore, the flows of the Laakso system are controlled by pumps – ***not*** valves. There is no need for any valves in Laakso system. In the applicants' opinion, it is not at all "obvious" to combine the teachings of Reinhall '444 with Laakso as the result would be a non-operable device. The deaerator of Laakso performs its task in the manner it is designed to operate, and new ways of using the valves cannot be incorporated in Laakso without defective results.[4]

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In fact, it should be understood that the true operation of the filter discussed in Gervasi is such that in the beginning of the operation cycle the entire device is filled with the liquid to be cleared. The filtering proceeds in such a manner that clear liquid is filtered through the filter surface and the filter cake is scraped down into the bottom cone. In other words, the filter cake as heavier material displaces the liquid from the bottom cone and gradually fills the bottom while new liquid is introduced into the device. The operation is continued until the bottom cone is filled whereafter the operation is shut down and the cone emptied.

Again, there is clearly no suggestion or impetus provided to the ordinarily skilled person to combine Gervasi with Laakso, because the purpose of the respective apparatus is so vastly different – namely, one is a filter, while the other a deaerator. Hence, even if it

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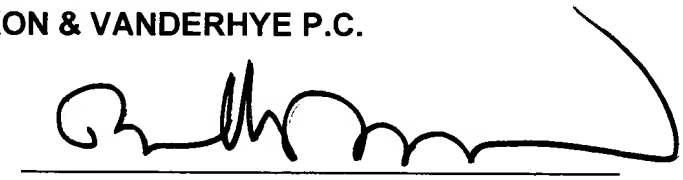
The Examiner's art-based rejections of the claims pending herein are in error and must be reversed as being inapposite to the proper standards for reviewing patentability under 35 USC §103(a). Such a decision is therefore solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

Bryan H. Davidson
Reg. No. 30,251

BHD:lmy
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

APPENDIX

Claims on Appeal – USSN 09/787,629

20. An apparatus for treating pulp, which apparatus comprises:

an essentially elongated outer casing having first and second ends which are closed with first and second end plates, respectively;

an inlet conduit, P_{in}, at said first end of said outer casing for introducing a fiber suspension to be treated into the apparatus;

a fiber suspension discharge conduit, P_{out}, at said second end of said outer casing for discharging a thickened fiber suspension from the apparatus; and

a filtrate discharge conduit, F_{out}, provided in said outer casing for the filtrate; wherein

essentially at least between the inlet conduit and the fiber suspension discharge conduit the apparatus includes,

(i) a filter surface having a substantially round cross section, and

(ii) a cleaning member positioned inside said filter surface, said cleaning member comprising a rotating shaft, and at least one screw thread fixed to said rotating shaft for keeping the filter surface clean, and wherein

the fiber suspension and filtrate discharge conduits for the thickened pulp and the filtrate, respectively, are provided with valves for controlling the operation of the apparatus, and wherein

said valves are controlled in response to input power to the shaft, on the basis of an impulse from a previous process stage or a pressure difference prevailing over the filter surface.

22. An apparatus according to claim 20, wherein the screw thread is fixed on the shaft by means of tie rods which leave a free space between the shaft and the screw thread.

23. An apparatus according to claim 22, wherein a clearance between the screw thread and the filter surface is less than 5 mm.

24. An apparatus according to claim 23, wherein the clearance between the screw thread and the filter surface is less than 3 mm.

25. An apparatus according to claim 22, wherein the filter surface is provided with guides which prevent the fiber suspension from rotating inside the filter surface.

26. An apparatus according to claim 23, wherein the clearance between the screw thread and the filter surface is 0.2 – 2 mm.

27. An apparatus according to claim 25, wherein said guides include essentially axial grooves.

28. An apparatus according to claim 25, wherein said filter surface includes a screen.